

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following remarks and discussion, is respectfully requested.

Claims 3-7 and 12-14 are currently pending in the application; Claims 1, 2, and 8-11 are canceled without prejudice or disclaimer, Claims 3-7 are amended, and new Claims 12-14 are added. Applicants respectfully assert that support for the changes to the claims is self-evident from the originally filed disclosure, including the original claims, and that therefore no new matter has been added.¹

In the Office Action Claims 2-7 were objected to because of informalities; Claims 1-3, 5, and 6 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,728,034 to Nakanishi et al. (Nakanishi); Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakanishi in view of U.S. Patent No. 5,907,436 to Perry et al. (Perry); and Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakanishi in view of U.S. Patent No. 5,914,811 to Chen.

As stated above Claims 2-7 were objected to because of informalities. In response, Applicants have canceled Claim 2. Applicants have further amended Claim 4 to recite “the incoming-side surface is configured to receive light external to the diffraction grating;” have amended Claims 3 and 4 to recite “the incoming-side diffraction grating and the at least one outgoing-side diffraction grating” in place of the previous recitations of “the diffraction grating;” and have amended Claim 7 to recite “a first step of the stairs” and “a second step of the stairs” in place of the previous recitations of “a step” and “another step.” Applicants have further amended the claims to remedy potential informalities and to place the claims in better

¹ Applicants respectfully assert that support for the changes to the claims is supported, in part, as follows: with respect to Claim 4, by original Claims 1 and 2; with respect to Claims 12 and 13, by original Claims 1, 2, and 4-6, as well as Applicants’ original Figure 2; and with respect to Claim 14, by original Claims 1, 2, and 4.

condition for examination and conformity with standard U.S. practice. Thus, Applicants respectfully request that the objection to remaining Claims 3-7 be withdrawn.

As stated above Claims 1-3, 5, and 6 are rejected under 35 U.S.C. § 102(e) as being anticipated by Nakanishi. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakanishi in view of Perry. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakanishi in view of Chen. Applicants respectfully assert that the rejections of the claims have been overcome for the following reasons.

The present invention is directed to diffraction elements. Independent Claim 4 recites a diffraction grating having a concave/convex shape in cross-section formed in an incoming-side surface and an outgoing-side surface of a transparent substrate. The incoming-side surface is opposite the outgoing-side surface, and the incoming-side surface is configured to receive light external to the diffraction grating. The diffraction grating includes an incoming-side diffraction grating disposed in a central region of the incoming-side surface and at least one outgoing-side diffraction grating disposed in the outgoing-side surface and configured to receive light diffracted by the incoming-side diffraction grating. The grating pitch of the incoming-side diffraction grating is substantially equal to the grating pitch of the at least one outgoing-side diffraction grating. The incoming-side diffraction grating and the at least one outgoing-side diffraction grating are formed in a single layer inorganic film formed on the incoming-side and outgoing-side surfaces.

Regarding the rejection of Claim 4, Nakanishi is directed to a diffractive optical element. Applicants respectfully assert that Nakanishi does not teach or suggest, and the Office Action explicitly concedes that Nakanishi does not teach or suggest, the claimed features of an incoming-side diffraction grating and an outgoing-side diffraction grating formed in a single layer inorganic film formed on incoming-side and outgoing-side surfaces of a substrate, as recited in the claim.

Specifically, independent Claim 4 recites “the incoming-side diffraction grating and the at least one outgoing-side diffraction grating are formed in a single layer inorganic film formed on the incoming-side and outgoing-side surfaces.”

The Office Action relies on Perry in an attempt to remedy the deficiencies of Nakanishi. Applicants respectfully assert that Perry does not remedy these deficiencies, however, for the following reasons.

Perry is directed to a multilayer dielectric diffraction grating. As shown in Figure 1A, for example, of Perry, a grating 2 is affixed onto a top layer of a dielectric stack 4, which is a multilayer structure.²

Applicants respectfully assert that Perry also does not teach or suggest, however, the claimed features of an incoming-side diffraction grating and an outgoing-side diffraction grating formed in a single layer inorganic film formed on incoming-side and outgoing-side surfaces of a substrate, as recited in independent Claim 4. Rather, as discussed above, the grating 2 of Perry is affixed onto the top layer of multilayer dielectric stack 4.

Applicants respectfully assert that the claimed invention can provide numerous advantages that are not provided by the references of record, including Perry. By way of specific non-limiting examples, Applicants respectfully assert that the claimed invention can provide a low cost, reliable, and easily produced diffraction element, because the diffraction element does not require the numerous layers in a multilayer film.

Thus, for the foregoing reasons, Applicants respectfully assert that neither Nakanishi nor Perry, whether taken alone or in combination, teaches or suggests the claimed features recited in independent Claim 4. Thus, Applicants respectfully request that the rejection of independent Claim 4 under 35 U.S.C. § 103(a) be withdrawn, and respectfully request the allowance of the independent claim.

² Column 4, line 57-61.

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Applicants respectfully assert that dependent Claims 3 and 5-7 are allowable for the same reasons as independent Claim 4 from which they depend, as well as for their own features. Thus, Applicants respectfully request the allowance of dependent Claims 3 and 5-7.

Applicants respectfully assert that new independent Claims 12 and 14, as well as Claim 13 depending from Claim 12, are allowable for reasons similar to those discussed with respect to Claim 4. Thus, Applicants respectfully request the allowance of new Claims 12-14.

Respectfully submitted,

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